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## Some Hitherto Undescribed Species of *Sparganothinae* from Nova Scotia, with Notes on Other Indigenous Species (Lepidoptera, Tortricidae)

BY JAMES H. McDUNNOUGH<sup>1</sup>

### INTRODUCTION

As a result of a study of the species belonging to the genus *Sparganothis* of the Maritime Provinces, several species were discovered for which no names appeared to be available. Because the long-awaited revision of this genus, which was prepared by Lambert as a Cornell University thesis, appears to be still delayed in publication, it has been decided that such species should be described in the present paper, together with notes on certain other species occurring in our Maritime fauna.

Based on the similarities in both the male and the female genitalia, the generic arrangement of the eastern North American species as proposed by Forbes (1924, Mem. Cornell Univ. Agr. Exp. Sta., no. 68, pp. 474–478) has proved to be essentially correct. In this paper the previously adopted genera *Cenopis* Zeller and *Platynota* Clemens have been reduced to the status of subgenera of *Sparganothis*. Other genera, formerly adopted by earlier workers in the group, such as *Dichelia* Guenée, *Oenectra* Guenée, *Epagoge* Hübner, *Leptoris* Clemens, and *Begunna* Walker, have for some time been considered as synonyms of *Sparganothis* Hübner, as noted by Obraztsov (1955, Tijdschr. voor Ent., vol. 98, pp. 196, 197). The 1939

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<sup>1</sup> Research Associate, Department of Entomology, the American Museum of Natural History, and of the Nova Scotia Museum of Science.

"Check list" employs *Sparganothis* for the bulk of the American species but retains *Platynota* for certain species with well-defined scale tufts on the primaries. Judging by the general similarity of the genitalia of *idaeusalis* Walker, the generotype, to those of other sparganothids, the retention of *Platynota* as a separate generic term seems hardly justifiable.

Two of the three new species described in the present paper fall into the *Cenopsis* section of Forbes, defined by him as "with the hair overhanging the front all cut off even, forming a regular horseshoe-shaped tuft so as to make the front deeply concave." Neither matches any of the eastern North American species placed by him in this section. The third species appears related to *pillleriana* Schiffermüller, the generotype of *Sparganothis*, judging by Obraztsov's genitalic figures (*ibid.*, figs. 364–366).

## SYSTEMATIC SECTION

### *Sparganothis pettitana* Robinson

*Tortrix pettitana* ROBINSON, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 209, figs. 21–23.

*Cenopsis pettitana*, ZELLER, 1875, Verhandl. Zool.-Bot. Gesell. Wien, p. 240. FERNALD, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 21; 1908, Genera of Tortricidae and their types, p. 60 (designated generotype).

*Sparganothis pettitana*, FORBES, 1924, Mem. Cornell Univ. Agr. Exp. Sta., no. 68, p. 477. MACKEY, 1952, Canadian Ent., vol. 84, pp. 233–236, 239, 240, figs. 26 (male socii and uncus), 27–29 (adults).

Three males, taken at light by D. Ferguson at Lake Kejimukujik, Queens County, Nova Scotia, July 20 and 21, have been examined. Judging by Robinson's and MacKay's figures, the specimens would fall to *pettitana* rather than to the more strongly banded form for which MacKay has proposed the specific name *acerivorana*. However, the larvae could not have been feeders on basswood, given as the food plant of *pettitana* by MacKay, as this tree does not occur in Nova Scotia. Ferguson was of the opinion that they might have been feeding on red oak, although maple also occurs in the region. Genitalic slides, made from the three above males, cannot be matched with either of MacKay's figures. The broader tegumen agrees well with the figure of *pettitana* but the gnathos arms are not so thick as depicted; they are slightly broader than in MacKay's figure of *acerivorana* but considerably shorter, not nearly touching the edges of the tegumen as shown in the figure. On the other hand a single, somewhat worn male in our collection from Jefferson Notch, New Hampshire, in which the brown costal maculation is greatly reduced shows in the genitalia a very deep space between the apices of the socii, and the gnathos arms are extremely long, extending as far as the

costal base of the clasper. Quite possibly such variations are merely individual, but, if so, the question arises as to whether the differences mentioned by MacKay might not fall into the same category and must therefore be discarded as of specific value. Further study is, of course, necessary before a definite decision in the matter can be reached. It might also be noted that the species *albicaudana* Busck (1915, Proc. Ent. Soc. Washington, vol. 17, p. 85) is stated by Forbes to be a maple-feeder. The species is unknown to the present writer but is worthy of consideration in connection with *acerivorana*.

*Sparganothis reticulatana* Clemens

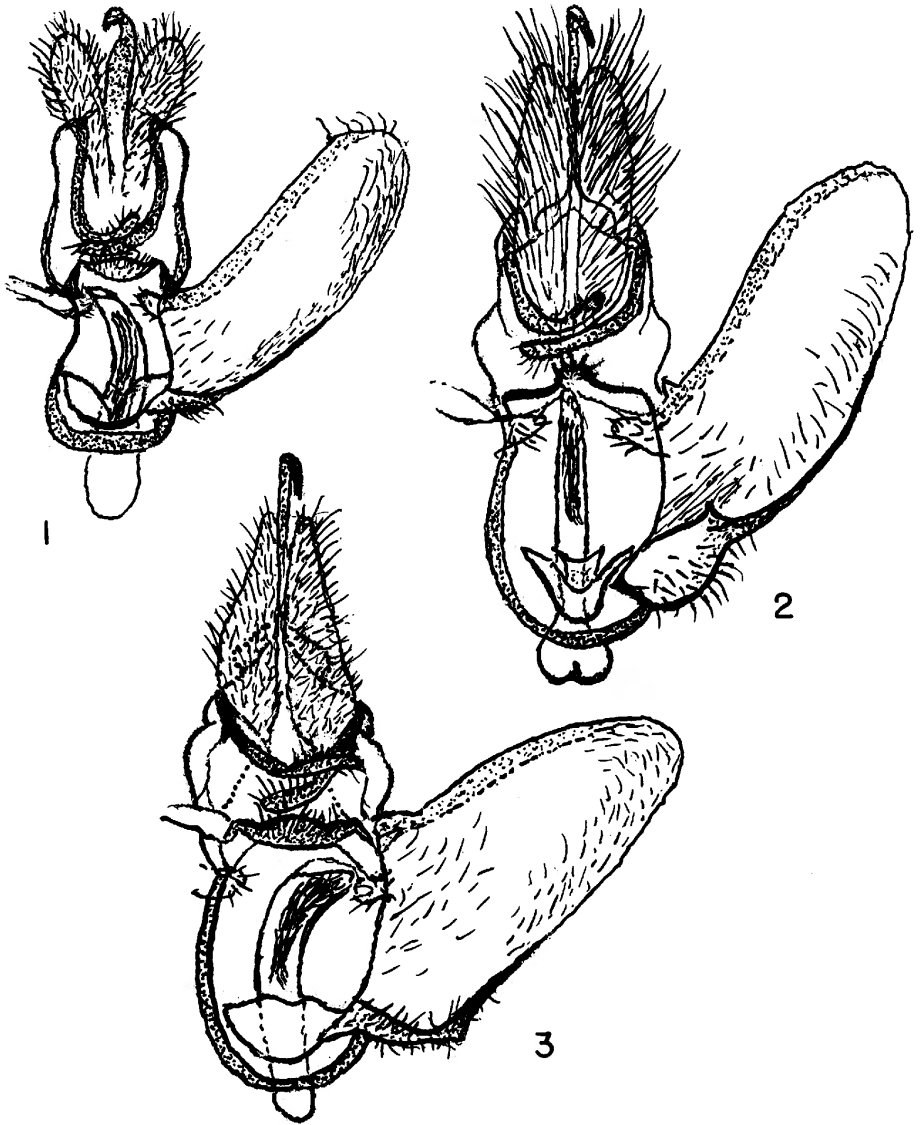
*Croesia* (?) *reticulatana* CLEMENS, 1860, Proc. Acad. Nat. Sci. Philadelphia, p. 353.  
*Tortrix reticulatana*, ROBINSON, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 272, figs. 33, 34. ZELLER, 1875, Verhandl. Zool.-Bot. Gesell. Wien, p. 233.  
*Cenopsis reticulatana*, FERNALD, 1882, Trans. Amer. Ent. Soc., vol. 19, p. 20.  
*Sparganothis reticulatana*, FORBES, 1924, Mem. Cornell Univ. Agr. Exp. Sta., no. 68, p. 477.

Forbes states: “. . . the dark, dominantly orange form is typical. The yellow one is the variety *gracilana* Walsingham.” Judging by a good series in our collection, the dark form is merely the normal female, the male showing a considerably paler color of the forewing. As to *gracilana*, this name, after the usage of Fernald, has usually been placed as a synonym of *sulfureana* Clemens, although described as species in *Cenopsis*. Nothing in our series of both these species can be matched with Walsingham's figure (1879, Illustrations of type specimens . . . in the British Museum, vol. 4, pl. 64, fig. 5), and a genitalic study of the type in the British Museum would be necessary for the correct placement to be determined. The male genitalia of *sulfureana* show a series of small lateral spines on the aedeagus, entirely lacking in the same organ in *reticulatana*.

***Sparganothis scotiana*, new species**

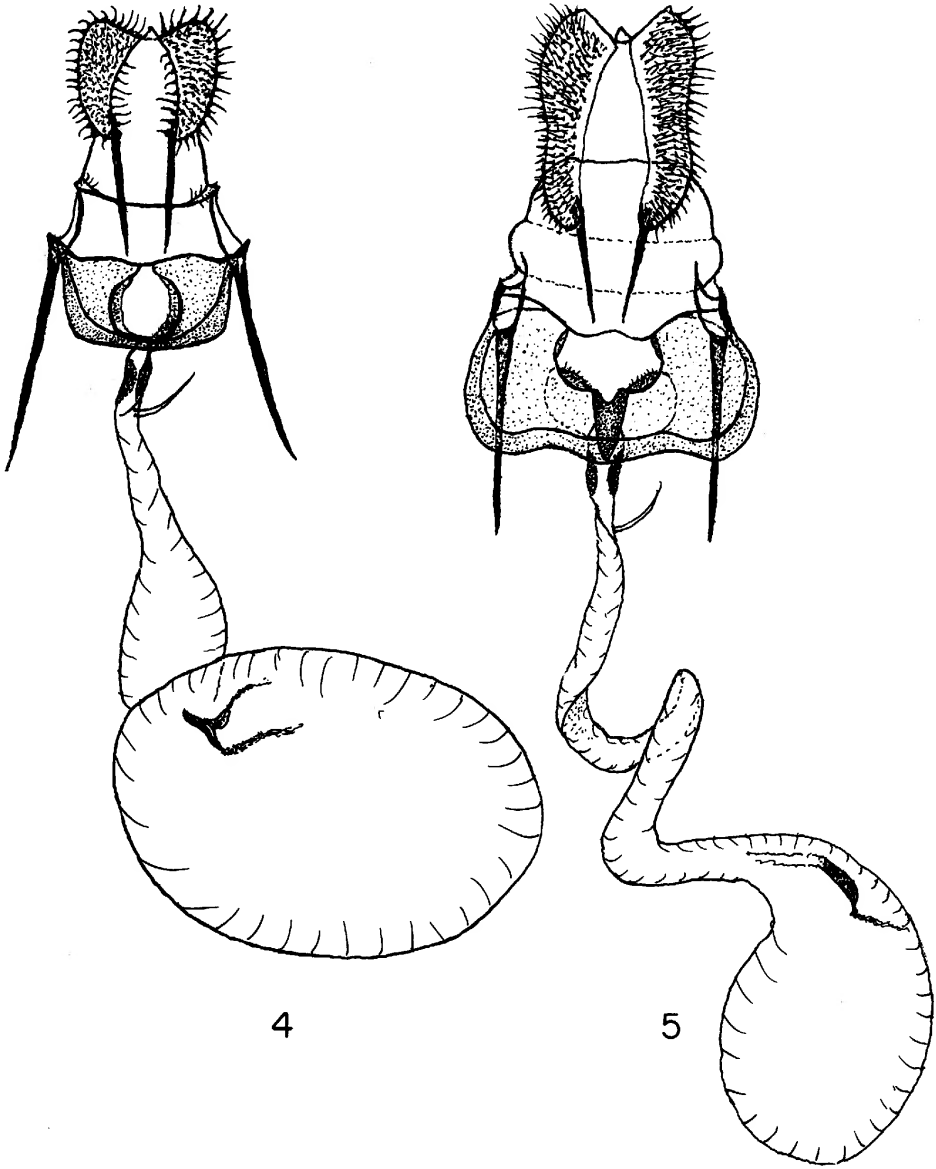
Figures 1, 4

MALE: Palpi porrect, rather short, white dorsally, with variable smoky suffusion laterally. Front of the *Cenopsis* type, white, antennae dark, feebly bifasciculate, thorax white, with two fine, black, lateral lines. Primaries with short costal fold, ground color dull white, confined to the following areas: a broad band along inner margin from base to middle, slightly reticulated with dark streaks distally; an irregular and poorly defined patch slightly beyond middle of costa, somewhat obscured by black reticulations; a large section of the terminal area variably and only slightly



FIGS. 1-3. Male genitalia. 1. *Sparganothis scotiana*, new species, holotype. 2. *S. daphnana*, new species, holotype. 3. *S. salinana*, new species, holotype.

reticulated. Basal third of wing between costa and fold blackish, with indications of a short, black, basal streak; this area very feebly defined outwardly by a pale shade. A poorly defined dark median band runs from a black shade on costa obliquely outward to inner margin before tornus; it is crossed by scattered, black reticulations and shows a faint ochreous tinge above inner margin. The most striking feature of the maculation



FIGS. 4, 5. Female genitalia. 4. *Sparganothis scotiana*, new species, allotype. 5. *S. daphnana*, new species, paratype.

consists of an oblong, black, pre-apical patch on the costa, below which is a short black streak in the cell indicative of the reniform. In the pale terminal area a faint, dull ochreous, oval spot occurs in some specimens (holotype and allotype, not paratypes); the lateral edges of this spot are partly defined by black, and there is a weak connection with the costal

patch. Outer margin slightly shaded with smoky, broadest below wing apex and fading out before tornus. Fringes pale; expanse, 15 mm.

FEMALE: Palpi thinner and much longer than those of the male. Maculation essentially the same but tending to become obscured by the coalescing of the dark areas. Expanse, 18 mm.

MALE GENITALIA (BASED ON HOLOTYPE): Uncus with basal two-thirds considerably broader than in other species, tapering towards apex, which is pointed and curved ventrad, extending somewhat beyond socii. Socii rather chunky, shorter than usual, their apices widely separated, vestiture consisting of rather short hairs. Gnathos arms very long and slender, their apices slightly broadened, setose, and overlapping. Sides of tegumen roughly parallel, very slightly sinuate. Claspers narrow, sides more or less parallel, rounded apically, costa broadly and feebly sclerotized for its entire length. Sacculus with short, broader basal section, tapering almost immediately to a fine rod extending less than halfway along the ventral margin of the clasper. Vinculum broadly rounded, short. Transtilla with the two arms joined in the median area to form a lunate sclerotized plate, furnished with numerous short spines, principally on its caudal section. Aedeagus thin, curving apically; vesica furnished with a bundle of long cornuti.

FEMALE GENITALIA (BASED ON ALLOTYPE): Closest to the organ in *idaeusalis*. Ovipositor lobes square-cut caudally, pointed cephalically, heavily setose. Genital plate lightly sclerotized, much broader than high, the two lobes separated narrowly on caudal margin, their opposite edges curving inward to join the ostium which is broadly ovular, with narrowly sclerotized outer edges, the whole resting on the cephalic edge of the genital plate. Ductus bursae initially narrow, with the usual slight sclerotization of its edges just distad to its inception; it gradually broadens without any convolution to enter the proximal end of the large, globular, membranous bursa. Signum consisting of an irregularly folded piece of chitin. Ductus seminalis arising as usual from the proximal section of the ductus bursae just cephalad of the sclerotized section.

TYPE MATERIAL: Holotype, male, Lake Kejimikujik, Queens County, Nova Scotia, July 22, 1957 (D. Ferguson). Allotype, female, same data, but August 2, 1957. Paratypes: One male, same data, July 20; one female, same data, August 19. The holotype and allotype are to be deposited in the Canadian National Collection at Ottawa; the paratypes are in the collection of the author.

***Sparganothis daphnana*, new species**

Figures 2, 5

MALE: Palpi deep brown, porrect, in length about equal to width of

head, second joint heavily but flatly scaled, third joint short, smooth, with faint whitish tip (not always evident). Front deep brown, definitely of the *Cenopsis* type. Thorax yellow-brown, with a darker anterior edge (often entirely suffused with brown). Primaries yellowish brown, when fresh with a decided metallic sheen, variably reticulate. A very short brown streak at base of costa indicates the fold. On costa at one-fourth is a deep brown patch of rather variable size from which a band runs obliquely across wing to a larger, brown patch on the middle of the inner margin (often narrowed or entirely broken in the cell). On costa at three-quarters is a second semitriangular deep brown patch from the outer edge of which two fine, brown lines run, parallel to each other, to the tornus. A third similar line arises on costa just before wing apex and runs parallel to outer margin. Tergites suffused with dark brown. Fringes paler. Secondaries deep smoky. Expanse, 17–19 mm.

**FEMALE:** Considerably larger than the male. Palpi thin, porrect, much longer than those of the male, deep brown. Head and thorax deep brown. Primaries darker than those of the male, deep brown, with slight purplish sheen when fresh. Maculation much as in the male but very obscure although faintly traceable, most prominent in the terminal section of the wing. Secondaries deep smoky. Expanse, 20 mm.

**MALE GENITALIA (BASED ON HOLOTYPE):** Tegumen with the lateral edges moderately bulging in the basal half. Uncus long and very thin, exceeding the length of the socii to a moderate extent, the apex bent ventrad. Socii long, of more or less even width throughout, heavily clothed with long hairs, closely appressed except at apices which are separated by a narrow, V-shaped space. Gnathos arms rather short, narrow at base, broadening gradually towards apex, the terminal sections overlapping and setose. Clasper rather broad, of almost even width throughout; apex rounded, costa weakly sclerotized; sacculus with the basal, sclerotized section much broader than usual, with a characteristic triangular projection on the inner margin near apex; narrowing rapidly it extends as a fine rod along the ventral margin of the clasper to well beyond the middle. Transtilla with the caudal edges narrowly sclerotized, broadening in the median area to a rounded-triangular projection bearing a number of spines apically. Vinculum short, nearly evenly rounded (at times with slight median bulge). Aedeagus long, thin, slightly curved apically, base bulbous; vesica furnished with a cluster of fine cornuti, about half of the length of the aedeagus.

**FEMALE GENITALIA (BASED ON PARATYPE):** Ovipositor lobes of more or less even width throughout, the caudal edges that slope inward meeting in the median area where a small, pointed projection represents the end

of the anus. Genital plate lightly sclerotized, much broader than high, the caudal edge broadly concave in the median section. Ostium very broad, situated on the caudal half of the genital plate; the convex sides are sclerotized and show two small, inward, feebly setose projections; at the mediocephalic end the sides join to form a sclerotized, funnel-like projection extending to the cephalic edge of the genital plate. The ductus bursae arises on the dorsal side of the funnel as a narrow, membranous tube, with the usual sclerotized sides just distad of its inception; just beyond this the ductus seminalis arises. Gradually broadening the ductus becomes somewhat twisted and forms a large convolution shortly before entering the oval membranous bursa which shows only faint scobination. The signum consists of a thin, chitinous rod somewhat beak-shaped at one end.

TYPE MATERIAL: Holotype, male, White Point Beach, Queens County, Nova Scotia, August 15, 1956 (J. McDunnough); bred from *Chamaedaphne*. Allotype, female, same data but August 27. Paratypes: Fifteen males, same locality, with following data: one, August 14, 1956, bred from *Ilex*; two, July 29, August 2, 1955, bred from *Aronia melanocarpa*; 12 collected in 1955 and 1956, mostly around *Myrica*, on dates between August 1 and 14. Five females, same locality, as follows: two, August 6 and 12, 1956, bred from *Chamaedaphne*; two, August 15 and 21, 1956, bred from *Ilex*; one, July 10, 1953, bred from *Myrica gale*. The holotype and the allotype are to be deposited in the Canadian National Collection; the paratypes are in the American Museum of Natural History and in author's collection.

LARVA: Green, with faint, whitish, subdorsal stripes and white pinacula. Head either brown or deep smoky. Prothoracic plate brown.

REMARKS: Females captured at White Point Beach and Lake Kejimikujik showed in their genitalia two small convolutions of the ductus bursae instead of the single one found in bred specimens. As in maculation and other sections of the genitalia no differences could be noted, it is presumed that such variation may be attributed to the influence of the spermatophore during copulation.

### **Sparganothis salinana**, new species

Figure 3

MALE: Palpi long, porrect, deep smoky brown outwardly, paler inwardly. Front deep brown, the projecting hairs presenting a rather *Cenopsis*-like appearance but not so sharply cut off apically. Thorax and abdomen dorsally smoky brown. Antennae dark brown, feebly bifascicu-



late. Primaries yellowish brown, variably reticulated with darker lines, mostly of a transverse nature; these lines are bordered brokenly with fine, metallic dots or streaks of silvery or slightly bluish tinge; these scales are easily rubbed off, leaving the wing with a more or less immaculate, brown coloration, crossed by a few fine, darker lines. Fringes paler. Secondaries deep smoky, with paler fringes, bordered basally by a thin, whitish line. Beneath, both wings deep smoky except costa of primaries which is tinged with brown. Fringes more prominently pale. Expanse, 20 mm.

**MALE GENITALIA (BASED ON HOLOTYPE):** Tegumen strongly bulging laterally. Uncus very thin and long, projecting considerably beyond apices of socii, its pointed apex curving ventrad. Socii clothed with short hairs, narrowing gradually from base to apex, separated apically by a short, V-shaped space. Gnathos arms rather short and thick, the enlarged, overlapping, terminal sections longer than usual and well clothed with setae. Clasper broad and rather short, tapering gradually from base to rounded apex; sacculus short, the basal section quite narrow, angled at its extremity to continue along the ventral edge of the clasper for a short distance as a fine rod ending considerably before half of its length. Transtilla arms joined in the median area to form a more or less rectangular plate, with convex caudal edge thickly covered with small spines. Vinculum short, rounded apically. Aedeagus broad, curving apically; vesica with a cluster of cornuti about half of the length of the aedeagus.

**TYPE MATERIAL:** Holotype, male, Argyle, Yarmouth County, August 6, 1957 (D. Ferguson). Paratypes: Two males, same data: one male, Lawrence Town beach, Halifax County, Nova Scotia, July 28, 1958 (D. Ferguson). All collected on a salt marsh. The holotype is to be deposited in the Canadian National Collection; the paratypes are in the American Museum of Natural History and in author's collection.

**REMARKS:** The species appears to be closely allied to the European *pillariana*, but the primaries show none of the cross-banding shown in Duponchel's figure (1842, *Histoire naturelle des lepidoptères de France*, supplement, vol. 4, p. 351, pl. 79, fig. 4a). Kennel's figure of the male (1910, *Die palaearctischen Tortriciden*, p. 118, pl. 6, fig. 38) shows similar cross-banding, his figure of the female (fig. 39) resembling the present species much more closely, apart from the lack of metallic scaling.

The genitalia show certain slight differences from the male genitalia of *pillariana* in the illustration given by Obraztsov (1955, *Die Gattungen der Palaearktischen Tortriciden*, p. 142, fig. 364). The socii apices are much closer together, possibly a variable feature; the median plate of the transtilla is much more heavily spined; the vinculum is more broadly

rounded; and the basal portion of the sacculus does not project pointedly over the ventral margin of the clasper.

The habitat in salt marshes also seems characteristic.

*Sparganothis irrorea* Robinson

*Tortrix irrorea* ROBINSON, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 274, pl. 5, fig. 44.

*Sparganothis irrorea*, FORBES, 1924, Mem. Cornell Agr. Exp. Sta., no. 68, p. 475.

A small series of males in the collection of the Nova Scotia Museum of Science from various localities in Nova Scotia matches Robinson's figure excellently. All specimens show on the primaries "a distinct large dark brown dot below the costa at basal third, and a patch of the same hue extending from beneath the cell obliquely outward to the internal margin," as stated by Robinson. Other features of the maculation also agree with the original description. A single female from Shad Bay, Halifax County, Nova Scotia, matches the males in the ground color of the primaries and maculation.

Besides the above series, there is a second series in the collection in which the male primaries are heavily reticulated with brown. The small dot below the costa is replaced by a small, irregular, brown patch on the costa, obliquely outward from which a larger brown area occurs in the fold but does not touch the inner margin; the pre-apical costal patch is larger. In six females from White Point Beach, Queens County, Nova Scotia, the ground color is a light brown, and the maculation, while similar to that of the male, is quite obscure. These specimens show no differences in genitalia from those of typical *irrorea*. Their maculation agrees rather well with Clemens' original description of *breviornatana* but not with Robinson's figures (*ibid.*, p. 269, pl. 4, figs. 24, 25) which were obviously not based on Clemens' type from Virginia.

Following the usage of Walsingham (1879, Illustrations of type specimens . . . in the British Museum, vol. 4, p. 20, fig. 10), *breviornatana* has been considered a synonym of *xanthoides* Walker, based on a female from Vancouver Island, which certainly shows considerable difference from Clemens' description. Through the courtesy of Mr. J. D. Bradley of the British Museum, a drawing of the genitalia of Walker's type has been furnished the author. This has been found to agree very closely with those of a female from Glenville, Cumberland County, Nova Scotia, identified by T. N. Freeman of Ottawa as *xanthoides* and also with the genitalia of the females above noted. The male genitalia of so-called *xanthoides* are

figured by Busck in the Barnes "Contributions" (1920, vol. 4, no. 3, pl. 31, fig. 2), but no data as to the origin of the specimen or its maculation are given. As far as can be judged from the rather blurred photographic reproduction, it agrees with the genitalia of the *irrorea* males already mentioned.

Under the circumstances it seems rather doubtful that *irrorea* is a species distinct from *xanthoides*, but lack of a good series of western material makes any definite conclusion impossible.

